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| 10/037,432 | 01/04/2002 | Mailvaganam Mahendran | 02-20 | 7749 |
| 27901 | 7590 | 06/15/2004 | EXAMINER | |
| ANDREW ALEXANDER & ASSOCIATES 3124 KIPP AVENUE P.O. BOX 2038 LOWER BURRELL, PA 15068 | | | MENON, KRISHNAN S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1723 | |

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/037,432

Applicant(s)

MAHENDRAN ET AL.

Examiner

Krishnan S Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-28, 32, 40-64 and 70-73 is/are pending in the application.
- 4a) Of the above claim(s) 46 and 47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-28, 32, 40-45, 48-64, and 70-73 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 20-28, 32, 40-45, 48-64, and 70-73 are pending. Claims 46 and 47 were withdrawn previously.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20-28, 32, 40-45, 48-64, and 70-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brun (781) in view of Mailvaganam et al (US 5,472,607).

Claim 20: Brun teaches a support for hollow fiber membranes made of a tubular braided support (col 3 lines 6-16) having 16-60 yarns, each yarn of 150-400 denier, between 1.5 and 2.5 mm diameter, and wall thickness in the range (see col 3 lines 29-38), and a porous membrane coated on the fabric suitable as a separation membrane (col 3 lines 9-67).

Brun does not teach the at least 30 pick/inch and the porous substance thickness being 0.05 and 0.3 mm. Mailvaganam teaches the pick per in of the braid in a membrane support of braided tube as 5-50, braided wall thickness about 0.1-0.7 mm, and the membrane thickness on the tube as in the range of

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100-1000 microns (0.01-1 mm). It would be obvious to one of ordinary skill in the art at the time of invention to use the teachings of Mailvaganam in the teaching of Brun for microfiltration of ultrafiltration hollow fiber membrane because Brun does not specifically teach these variables (see Mailvaganam col 11 lines 1-56)

Claims 22-25: The shrunken length of the support could be adjusted to at least 1% as in claim 22, between 1 and 20% as in claim 23 and between 1 and 8% as in claim 24 (col 4 lines 10-20: length adjustable by process). The support is flexible as in claim 25 (examples).

Claims 21 and 26: Shrunken before attaching porous substance – see col 3 lines 34-40: heat treatment causes shrinkage. Re extension at break as in claims 21 and 26, Brun is silent, but this is inherent in the property of the material of the support (polyester or polyamide) – same material and shrunk in similar conditions (The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d, 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).).

Claims 27,28: The air permeability is not disclosed by Brun, but is an inherent property, since the material of the braid (polyester, polyamide), weave, and the processing (pre-shrinking) conditions (see examples, col 3 lines 29-38 and col 4 lines 13-17) are similar (in re Best).

Claim 32: The support is not embedded in the porous substance (examples: coated or deposited 'on').

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Claims 40,41: 1-3 filament ends, and 40-100, 3-6 denier filaments - see Brun: examples, and col 3 lines 28-33.

Claim 42: Brun does not specify the weave of the braid. However, since Brun does not specify the weave pattern, it would be obvious to one of ordinary skill in the art at the time of invention to chose a standard weave such as 'regular' or 'diamond' weave.

Claim 43: the multifilament yarn ends are non-plyed, with 1-3 multifilament ends (col 3 lines 29-33: Brun teaches plyed yarns only in examples 3 and 7, rest, therefore, may be non-plyed)

Claim 44: the porosity of the porous substance is suitable for micro or ultra – filtration membranes (col 3 lines 50-67).

Claim 45: moisture gain is an inherent property of the material (In re Best)

Claim 48: Brun teaches a support for hollow fiber membranes made of a fabric of braided yarn, and a porous membrane coated on the fabric suitable as a separation membrane (col 3 lines 9-67), with the deniers, the carriers (number of yarns) and the outside diameter. Brun does not teach the crosses/inch and the wall thickness. Mailvaganam teaches the number of picks for the tubular support for hollow fiber membranes and wall thickness (col 8 lines 13-32; col 11 lines 1-56). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Mailvaganam in the teaching of Brun for the number of picks in the braids because Brun is silent on it. (see also rejection of claim 20)

Claims 49-71 depend from claim 48, and add further limitations as follows:

Claim 49: Brun teaches Yarns and ends in the examples.

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Claim 50: see rejection of claim 41.

Claim 51: adds further limitation of the pattern of the weave, on which Brun in view of Mailvaganam is silent. However, since Brun in view of Mailvaganam does not specify the weave pattern, it would be obvious to one of ordinary skill in the art at the time of invention to chose a standard weave such as 'regular' or 'diamond' weave.

Claim 52: see rejection of claim 43

Claim 53: The air permeability is not disclosed by Brun in view of Mailvaganam, but is an inherent property, since the material of the braid, and the processing (pre-shrinking) conditions (see examples and col 4 lines 13-17) are similar (in re Best).

Claims 54-55: Membrane is pre-shrunk to a stable length (col 4 lines 10-20). Re extension at break, Brun is silent, but this is inherent in the property of the material of the support – same material and shrunk in similar conditions.

Claims 56-60: The shrunken length of the support could be adjusted to at least 1%, between 1 and 20% and between 1 and 8% (col 4 lines 10-20: shrunken length is adjustable). The support is flexible, macroporous and tubular (examples).

Claims 61-63: Re thickness of the porous substance on the support, Brun is silent. However, this is a result-effective variable. Discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. (In re Boesch and Slaney, ...)

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Claim 64: The support is not embedded in the porous substance (examples: coated or deposited 'on').

Claims 70: micro or ultrafiltration membrane (col 3 lines 50-67)

Claim 71: Moisture gain is an inherent property of the material (in re Best).

Claim 72: the carrier is a part of the braiding machine, and therefore, cannot be a limitation for the product (membrane).

Claim 73: The braided surface has a natural rough and uneven surface formed by the overlapping yarns – it is inherent in the braiding. The express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. "The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness." In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1784 (Fed. Cir. 1995) (affirmed a 35 U.S.C. 103 rejection based in part on inherent disclosure in one of the references). See also In re Grasselli, 713 F.2d 731, 739, 218 USPQ 769, 775 (Fed. Cir. 1983).

Response to Arguments

Applicant's arguments filed 4/12/04 have been fully considered but they are not persuasive.

In response to applicants' arguments that (1) office action has not established any motivation to apply the teaching of ... Mailvaganam to the teaching of Brun et al., and (2) ... there are reasons why a person skilled in the

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art would not combine the [references]: Brun does not specify the picks/inch, which is the number of crosses of yarns per inch in the weave. Since one of ordinary skill in the art needs to know the picks/in for the weave of the braid, one would be motivated to look at similar references, like Mailvaganam, which teaches hollow fiber membranes supported by braided tubes. Now, the applicants' reason of why "one skilled in the art" would not use the Mailvaganam teaching in the Brun teaching does has no merit because one of ordinary skill need to start somewhere for a braid and need a value for the pick/in; Brun obtains the 'considerably reduced' unevenness in the sheath by heat treatment of a braided sheath; applicants claim heat treatment to reduce shrinkage; and even if Mailvaganam's teaching cause surface roughness, it would be smoothed out in the heat treatment as taught by Brun.

In response to the applicants' argument that Brun does not anticipate claims 22-24, 21,26, 27 and 28 and make obvious claims 56-58, 55,53 and 60: Brun teaches adjusting the shrinkage as claimed. Any teaching beyond this, whether preferable or not, does not negate the anticipation or obviousness: "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments" (In re *Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)). Extension at break is a property of the material and the weave; Brun in view of Mailvaganam teaches similar material and weave as that of the applicant, therefore, inherent. The same argument is true for air permeability.

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In response to applicants' argument of "obvious to try" for the weave pattern, again, it may be noted that one has to have a pattern for the weave for the braid, and one of ordinary skill in the art would go for the standard or common weave, when there is no specific teaching is available. This would be the obvious thing to do; not just obvious to try. Applicant does not relate any specific function or property that is related specific to the weave selected.

Argument re non-ply: this part is further clarified in the rejection. Re the argument that 'mere silence with respect to a feature cannot be construed as a disclosure of that feature', as applicant pointed out, the Brun reference does teach twisting in examples 3 and 7. Therefore, the rest of the examples would be 'without twisting (or non-ply). Since there are only two possibilities, ply or non-ply, absence of a specific teaching of ply or non-ply would indicate that either of them would be equivalent for the purpose, and therefore obvious; unless the applicant can show unexpected results from the choice of one over the other.

Argument re preshrunk length: Brun gives an extensive treatise on the heat treatment in col 1 line 60 – col 4 line 51. Details of how the braided sheath is stabilized by heat treatment against mechanical stresses is given in col 2 lines 37-45, which includes the stabilization of the length.

Argument re claim 73, surface roughness: Brun provides a calibrated sheath, which is *preferably* smooth. See col 2 lines 49-57 for what Brun teaches as the "even surface". According to Brun, an uneven braided surface would result in tearing the membrane off from the surface. Evenness according to Brun is the ability to retain the circular cross-section without creating sharp bends

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which would damage the membrane. The roughness according to Mailvaganam, on the other hand, is explained in the following sentence: "A thin film membrane, indicated generally by reference numeral 33, is self-adherently secured to the circumferential outer surface 34 of the braid of woven yarn 31 which is rough and uneven because it is formed by the interwoven yarn which, in the range of thickness used and the number of picks in which it is woven, does not result in an even surface." One of ordinary skill in the art would recognize that the Brun's smooth or even surface" meant a braided surface which would retain its circular shape well to keep the membrane from damaging, whereas, Mailvaganam's rough surface is the surface roughness caused by the weave of the braid. Naturally, the braided surface of Brun also would show the roughness caused by the weave of the braid, but the sheath cross-section still would be overall in the circular shape. One of ordinary skill in the art would use the teaching of Mailvaganam in the brun's teachings to provide the braid because Brun does not specify the number of picks. Even if it be argued that Brun's teachings provide a smooth surface, as in smooth over the weaves of the braid, it still would be anticipatory for this element of the claim, because Brun teaches the smooth surface as 'preferred', which would not negate the anticipation of the non-preferred roughness of the braided surface. (In re Susi)

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

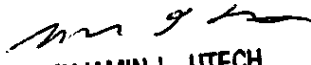
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Krishnan Menon
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